GPSMAP® 4000/5000 Series Installation Instructions

The GPSMAP 4000/5000 series chartplotter and GPS 17 antenna must be properly installed according to the following instructions. You need the appropriate fasteners, tools, and mounts listed in each section. These items are available at most marine dealers. Always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding. When drilling or cutting, always check what is on the opposite side of the surface. Mount the GPSMAP 4000/5000 series unit in a location that provides a clear, glare-free view of the display and easy operation of the controls or touch screen. **If you experience difficulty installing the unit, seek the assistance of a professional installer; or contact Garmin Product Support by phone at 913/397.8200 or 800/800.1020, Monday–Friday, 8 AM–5 PM Central Time. Go to www.garmin.com/support/ and click on Product Support for more information. In Europe, contact Garmin (Europe) Ltd. at 44/0870.8501241.**

To install the GPSMAP 4000/5000 series unit:

1. Mount the unit.
2. Mount the antenna.
3. Connect the unit to power and to the antenna.
4. Ensure the unit software is up-to-date.

Though they are not necessary to use the GPSMAP 4000/5000 unit, this manual covers other installation options:

- Connect the unit to other network compatible Garmin devices, such as a sounder or radar.
- Connect the unit to other NMEA 0183 compatible devices such as a VHF radio with DSC.
- Connect the unit to an external alarm.
- Connect the unit to a NMEA 2000 source (available on some boats) for various mechanical and navigation information.
- Connect the unit to a video input source.
- Connect the unit to an external video monitor.

Surface Mounting the GPSMAP 4000/5000 Series Unit

Tools required (not included):

- Drill and drill bit
- Screwdriver
- Pencil
- Mounting hardware (screws or nuts, washers, and bolts)

NOTE: The mounting hardware (screws or nuts, washers, and bolts) are not included. The holes on the bail mount are $^{5}/_{16}$" (7.9 mm) in diameter. Choose mounting hardware that fits the holes in the bail mount and best attaches it to your specific mounting surface. The size of the drill bit required depends on the mounting hardware chosen.

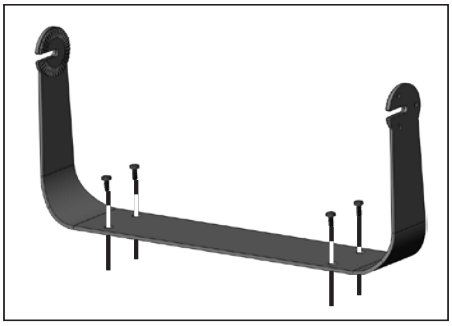
July 2007 190-00779-02 Rev. C Printed in Taiwan

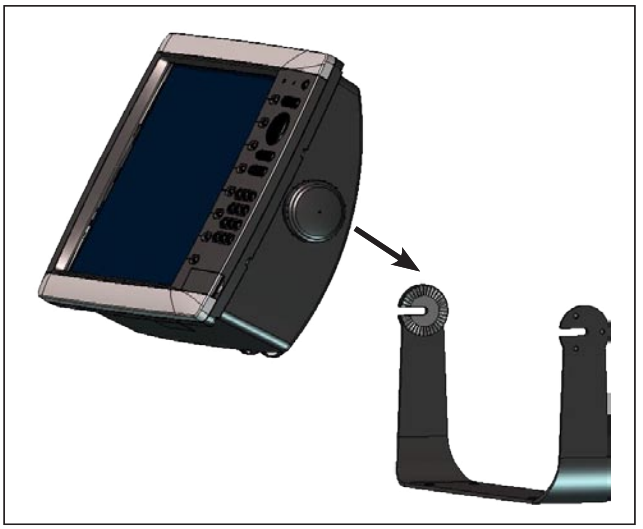
To install the bail mount and unit:

1. Using the bail mount as a template, mark the location of the four mounting holes. Be sure to leave at least 5" (12.7 cm) of clearance behind the unit for the wiring.

NOTE: Mount a 4008/4208/5008/5208 unit 31 1/4" (80 cm), and a 4012/4212/5012/5212 unit 39 3/8" from a magnetic compass to avoid interference.

2. Using an appropriately sized drill bit, drill the pilot holes for your mounting hardware.
3. Secure the bail mount to the surface with your mounting hardware.
4. Loosely attach the mounting knobs to the GPSMAP 4000/5000 series unit.
5. Slide the unit onto the bail mount, and tighten the mounting knobs.





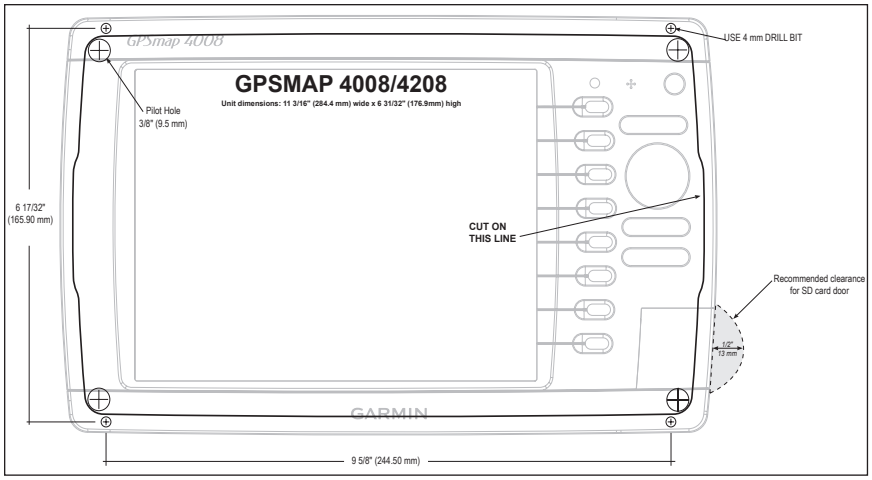
Flush Mounting the GPSMAP 4000/5000 Series Unit

Hardware (included):

- Flush mount template
- Four threaded 4 mm mounting studs
- Four 4 mm flat washers
- Four 4 mm lock washers
- Four 4 mm nuts

Tools required (not included):

- Jig saw
- Masking tape
- Scissors
- Drill
- Drill bits—3/8" (6 mm) and 4 mm
- 1/16" (2 mm) Allen (Hex) wrench
- 4 mm sockets or wrenches
- Center punch and hammer



Flush Mount Template Example (not to scale)

To flush mount the unit:

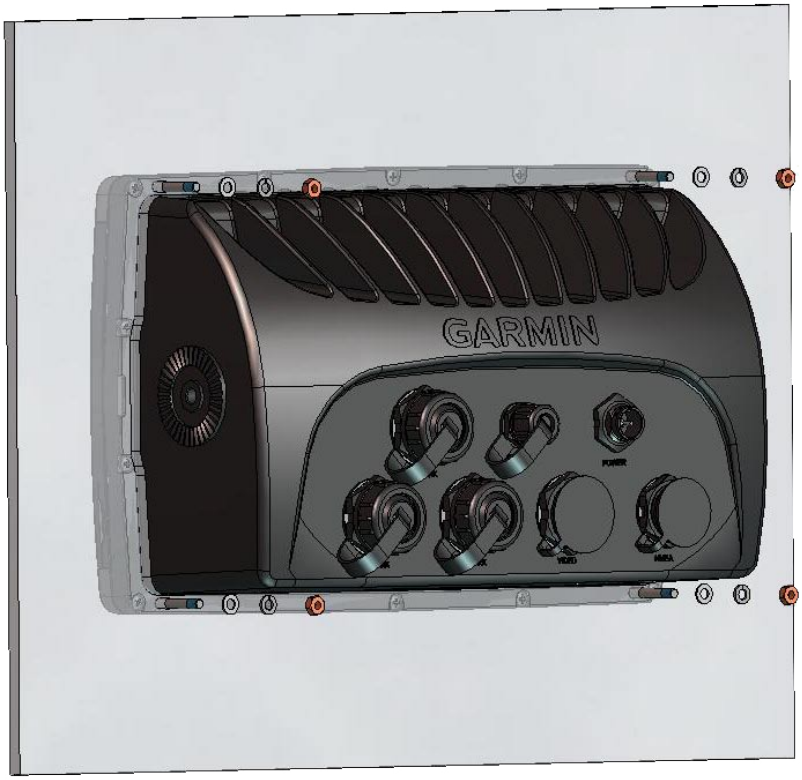
1. The flush mount template is included in the product box. Trim the template and ensure it will fit in the location you want to flush mount the unit.

NOTE: Make sure the surface on which you mount the unit has at least 7" (17.75 cm) of open space behind it to fit the unit and the connected wires.

NOTE: Make sure to leave approximately 1/2" (13 mm) of space on the right side of the unit to access the SD card door.

NOTE: Mount a 4008/4208/5008/5208 unit 31 1/4" (80 cm), and a 4012/4212/5012/5212 unit 39 3/8" (1 m) from a magnetic compass to avoid interference.

2. The flush mount template has adhesive on the back. Remove the protective liner and apply the template to the location you want to mount the unit.
3. Using the center punch, indent the center of each of the 4 mm mounting hole locations.
4. Using a 4 mm drill bit, drill the four mounting holes.
5. Using a 3/8" (6 mm) drill bit, drill one or more of the four pilot holes inside the corner of the template to begin cutting the mounting surface.
6. Using the jig saw, cut the mounting surface along the inside of the solid line indicated on the flush mount template. Use a file and sandpaper to refine the size of the hole. **Be very careful when cutting this hole. There is only a small amount of clearance between the case and the mounting holes.**
7. Install the four mounting studs into the unit by screwing the shorter, threaded section into the back of the unit. Use the 1/16" (2 mm) Allen wrench to tighten the mounting studs until they stop. **Do not overtighten - you may damage the mounting stud or the mounting holes.** The studs are coated with a reusable thread-locking patch applied at the factory.
8. Place the unit into the cut-out. The four mounting studs should feed through the 4 mounting holes drilled in step 3.
9. Place the flat washers, then the lock washers over the mounting studs. Thread the hex nuts onto the mounting studs. Tighten all four hex nuts evenly until the unit is snug against the mounting surface.



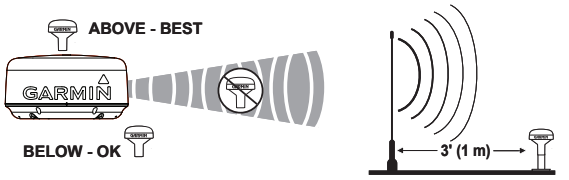
Flush Mounting the GPSMAP 4000/5000 Series Unit

Mounting the GPS 17 Antenna

Either flush mount the GPS 17 Antenna or install it on on any standard 1" O. D. 14 threads-per-inch marine mount. When mounting the GPS 17, the cable can be run externally, through the mounting surface, or through the center of the marine mount.

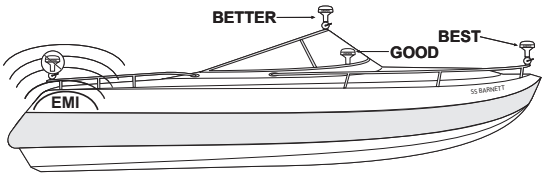
The GPS 17 connects to the 19-pin NMEA 0183 cable on the GPSMAP 4000/5000 series unit and provides the GPS/WAAS signal to the unit. If two or more Garmin Marine Network chartplotters are installed and connected to a network, only install one GPS 17 antenna. See page 5 for wiring instructions.

To ensure the best reception, mount the GPS 17 antenna in a location that has a clear, unobstructed view of the sky in all directions. Avoid mounting the GPS 17 where it is shaded by the boat's superstructure, a radome antenna, or mast. On a sailboat, avoid mounting the antenna high on the mast to prevent inaccurate speed readings caused by excessive heeling. The antenna provides more stable readings when located nearer to water level. **Mount the GPS 17 at least 3 ft (1 m) away from (preferably above) the path of any radar beam or a VHF radio antenna.** Temporarily secure the antenna in the preferred mounting location and test for correct operation. If you experience interference with other electronics, try a different location. When you verify correct operation, permanently mount the antenna.



Radar **VHF Radio Antenna**

NOTE: Mount the antenna at least 3 ft (1 m) away from (preferably above) the path of any radar beam or a VHF radio antenna.



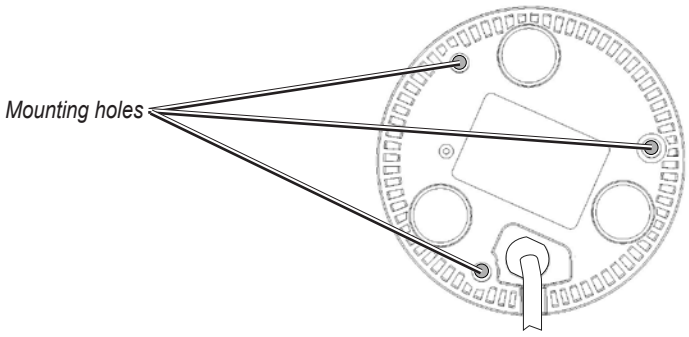
EMI (Electromagnetic Interference) from engine components

GPS Signal Interference

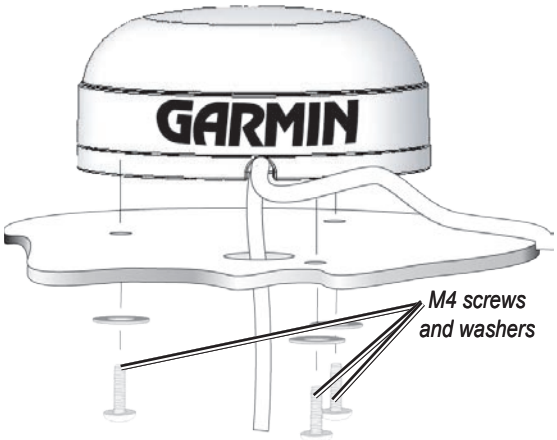
NOTE: Never paint the GPS 17 antenna or clean it with harsh solvents.

To flush mount the GPS 17:

1. Cut out the Flush Mount Drilling Template provided on page 11, and tape it on the selected mounting location.
2. Mark the center of each mounting hole by tapping the end of a center punch or pointed object with a hammer. If you plan to run the cable through the mounting surface, mark the center of the additional, larger, hole indicated on the template.
3. Drill the mounting holes using a $^{11}/_{64}$" (4.5 mm) drill bit. If you plan to run the cable through the mounting surface, drill the hole using a $^{3}/_{4}$" (19 mm) drill bit.
4. If you are routing the cable through the mounting surface feed it through the larger hole, and apply marine sealant to the outside exit area.
5. Align the GPS 17 over the mounting holes, and fasten it using M4 screws (not included). The mounting threads in the GPS 17 are 8.10 mm deep. Use screws of a proper length for the mounting surface, which do not thread into the GPS 17 deeper than 8 mm. Screws which thread deeper than 8 mm may damage the case.



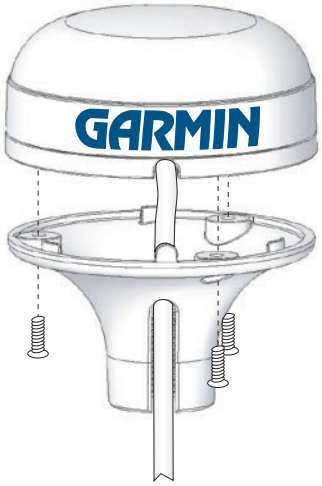
Bottom of GPS 17 Antenna



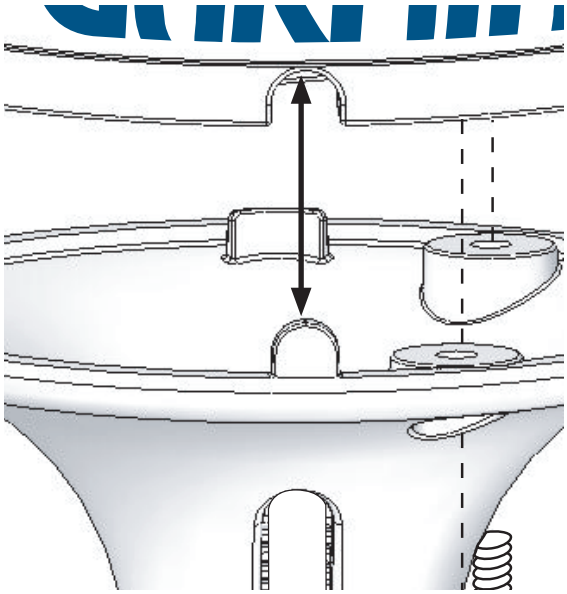
When installing the GPS 17, you can run the coax through the mounting surface or outside of the unit. If the coax is run through the mounting surface, seal the outside exit area with marine sealant.

To attach the enclosed pole mount adapter to the GPS 17:

1. Thread the cable though the pole mount adapter.
2. Align the tab on the pole mount adapter to the notch on the GPS 17.
3. Use the enclosed screws to secure the pole mount adapter to the base of the GPS 17.



Attaching the Pole Mount Adapter to the GPS 17



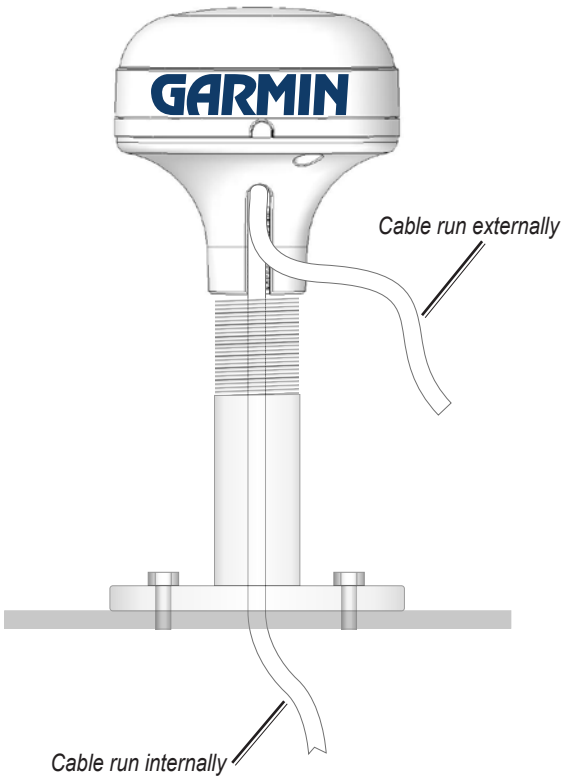
Align Notch

To mount the GPS 17 with the cable run outside the mount:

1. Place the cable in the vertical slot along the base of the assembled GPS 17 and pole mount adapter.
2. Screw the assembled GPS 17 and pole mount adapter onto a standard 1" O. D. 14 threads-per-inch marine mount (not included). **DO NOT overtighten the head**. Overtightening the unit may cut the cable.
3. With the GPS 17 installed on the pole mount, fill the remaining gap in the cable exit with a marine sealant.
4. Fasten the pole mount to the boat if it is not already attached.
5. Route the cable away from sources of electronic interference.

To mount the GPS 17 with the cable run through the mount:

1. Position a standard 1" O. D. (Outer Dimension), 14 threads-per-inch marine mount (not included) in the preferred location, and mark the approximate center of the mount.
2. Drill a hole using a $^{3}/_{4}$" (19 mm) drill bit for the cable to pass through.
3. Fasten the pole mount to the boat .
4. Slide the cable through the pole mount and screw the assembled GPS 17 and pole mount adapter onto the pole mount.
5. Route the cable away from sources of electronic interference.

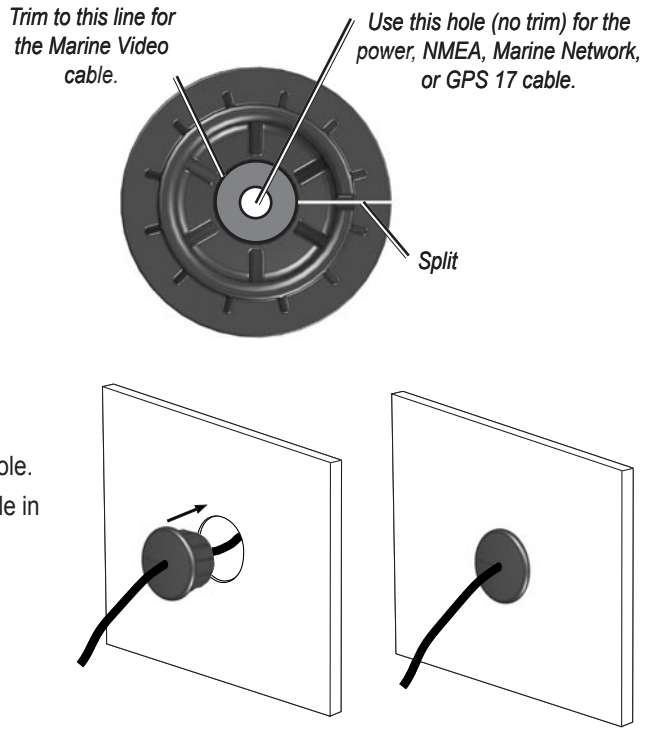


Attaching the GPS 17 to a Pole Mount

Wiring and Cables

The GPSMAP 4000/5000 series unit comes with a power cable, a 19-pin NMEA 0183 data cable, and a 17-pin Marine Video cable. Optional Garmin Marine Network components use specialized Garmin Network cables. Depending on the installation, it may be necessary to drill holes to route the connector end of these cables. Garmin rubber grommets are provided to cover these holes for a finished look.

You may not need the grommets in some installations. The grommets do NOT create a waterproof seal. Apply a marine sealant around the grommet and cable after installation. Be sure to test the system before installing and sealing the grommets. Purchase additional grommets from your Garmin dealer or directly from Garmin at www.garmin.com.



Tools

- Drill
- 1 1/4" (31.7 mm) paddle drill bit or hole saw
- Utility knife
- Marine sealant (optional)

To install the cable grommet:

1. Mark the location where you want to route the power, NMEA 0183, Marine Video, or Marine Network cable.
2. Using a 1 1/4" (31.7 mm) paddle drill bit or hole saw, drill the installation hole.
3. Refer to the diagram for trimming instructions. Carefully trim the cable hole in the grommet, as needed.
4. Route the cable to the unit, and test the system.
5. Spread the grommet apart at the split and place it around the cable.
6. Firmly push the grommet into the installation hole until it is seated. Apply marine sealant, as needed, to weatherproof the cable.

Wiring the Power Cable

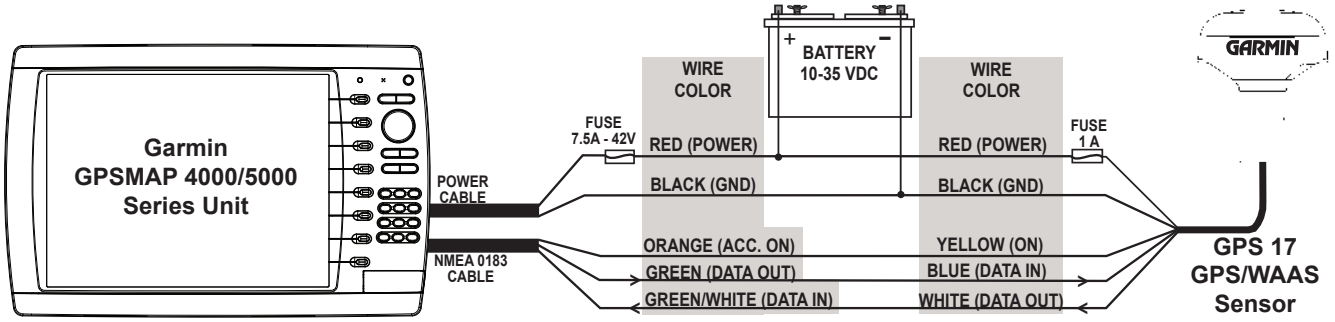
The GPSMAP 4000/5000 series unit must be connected to the boat's power supply. Use the 2-pin power cable included, and connect the power (red) and ground (black) wires. Use 14 AWG shielded wiring for extended runs of wire to the power cable. Solder all connections and seal them with heat shrink tubing.

Ensuring

Wiring the GPS 17 Antenna

The GPS 17 antenna must be wired to the included 19-pin NMEA 0183 cable as well as to the boat's power supply. Refer to the diagram below when wiring the GPS 17 to the 19-pin NMEA 0183 cable. Use 22 AWG shielded wiring for extended runs of wire to the NMEA 0183 cable or GPS 17 cable. Solder all connections and seal them with heat shrink tubing.

NOTE: If you are using more than one Garmin chartplotter over a Garmin Marine Network, only wire one chartplotter to a GPS 17. The GPS signal is shared between multiple chartplotters connected to a Garmin Marine Network.



Wiring the GPSMAP 4000/5000 Unit and the GPS 17

Wiring a Garmin Marine Network

The optional Garmin Marine Network is a plug-and-play system that allows for high-speed data transfer between multiple Garmin chartplotters and other network compatible Garmin devices such as a Garmin sonar unit (GSD 22), a Garmin radar (GMR 18 or GMR 404/406), or an XM Weather receiver (GDL30/30A). The GPSMAP 4000/5000 units have three network ports that can be used to connect other Garmin network compatible chartplotters and devices. If the network requires more ports, use a Garmin Marine Network port extender (GMS 10), or another GPSMAP 4000/5000. Data from each connected component is shared by all the connected Garmin chartplotters.

Notes:

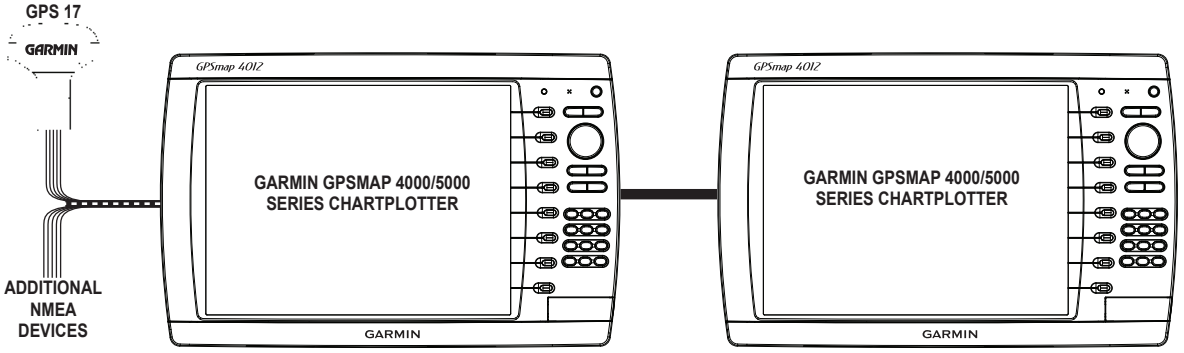
- The GPS 17 antenna and standard NMEA devices must all be wired to one chartplotter on the network. The data is then shared over the network to other connected chartplotters.
- Connect network components, such as a Garmin GMR radar, GSD sounder, or GDL XM Weather receiver to any chartplotter on the network or to an optional GMS 10 Network Port Expander. Data is shared between all chartplotters on the network.
- BlueChart® g2 Vision cartography data is shared between any connected GPSMAP 4000/5000 series chartplotter.
- Video input(s) from the Marine Video cable is only viewable on the chartplotter to which it is connected.
- You can connect a GPSMAP 4000/5000 chartplotter to a Marine Network with a GPSMAP 3000 series chartplotter:
 - They will share GPS 17 GPS position information as well as information to and from standard NMEA 0183 devices.
 - They will share information from connected network compatible Garmin devices such as a sonar unit (GSD 22), a radar (GMR 18 or GMR 404/406), or an XM Weather receiver (GDL30/30A).
 - Garmin GPSMAP 3000 series units CANNOT share cartography data with the GPSMAP 4000/5000 units.
- All network components must be connected to the boat's power source according to their installation instructions. The following diagrams show only the network connections, not power connections.
- Currently, XM Weather and audio service is only available in North America. Because of this, a connected XM Weather receiver (GDL30/30A) will only function in North America.

The Garmin Marine Network Cable:

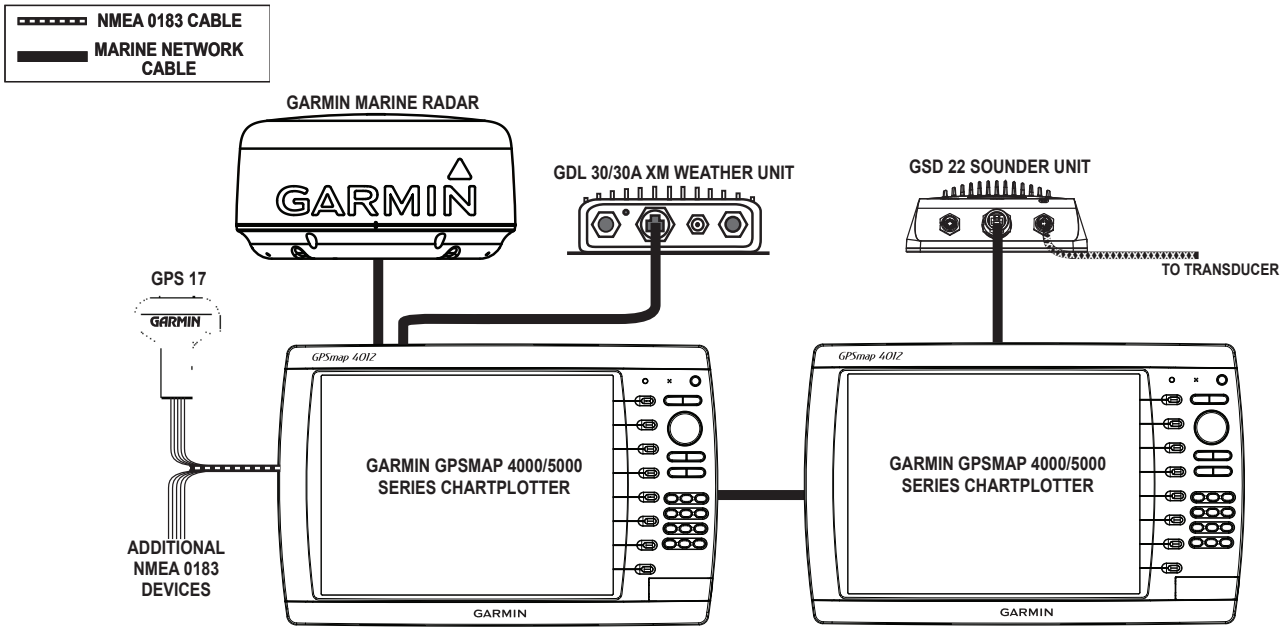
- The Garmin Marine Network Cable has a locking ring that secures the cable to the chartplotter or marine network device. Because of the size of this locking ring, it is not connected to the network cable at the factory to make it easier to install on your boat.
- Once the cable is run to the chartplotter or network device, snap the locking ring together around the connector and insert the rubber washer as indicated on the instructions packaged with the cable.



Sample Garmin Marine Network Setups:

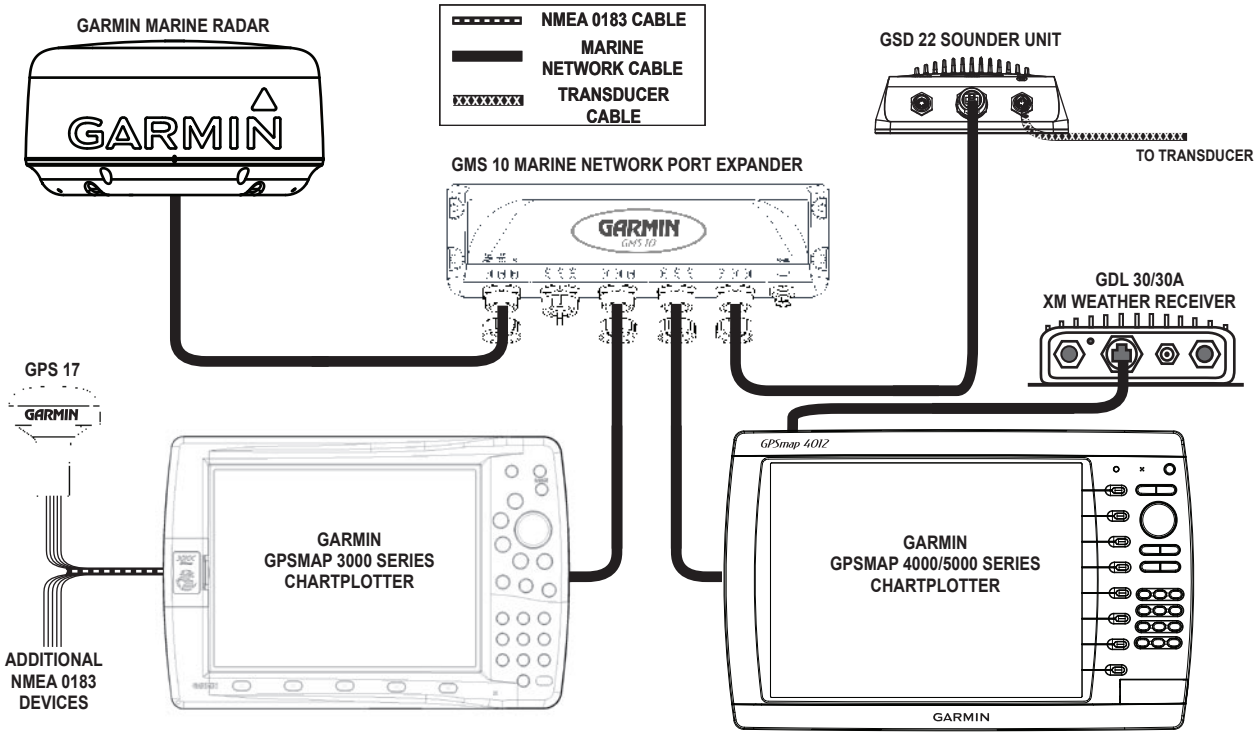


Marine Network with Two Chartplotters



Extended Marine Network With Two Chartplotters

NOTE: Every device connected to the Garmin Marine Network must be connected to the boat's power supply. These diagrams only show the network connections, and do not show the power connections. Wire each device according to its installation instructions.



Connecting a GPSMAP 4000/5000 Series chartplotter to an existing Garmin Marine Network

NOTE: When connecting a 4000/5000 series chartplotter to an existing Garmin Marine Network, the GMS 10 can be used, but is not necessary. The 4000/5000 series chartplotter has three network ports, and acts as a port expander. Wire the GPS 17 and additional NMEA devices to either the existing 3000 series chartplotter or the new 4000/5000 Series chartplotter. The existing 3000 series unit and the new 4000/5000 series unit share NMEA 0183 and Garmin Marine Network data, but do not share cartography.

NOTE: Every device connected to the Garmin Marine Network must be connected to the boat's power supply. These diagrams only show the network connections, and do not show the power connections. Wire each device according to its installation instructions.

Wiring Additional NMEA 0183 Devices

The NMEA 0183 data cable included with the GPSMAP 4000/5000 series chartplotter supports the NMEA 0183 standard, which is used to wire various NMEA 0183-compliant devices, such as VHF radios, NMEA instruments, autopilots, or a computer.

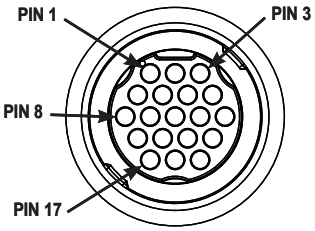
The GPSMAP 4000/5000 series unit features four ports to receive NMEA 0183 data (RX ports), and two ports to send NMEA 0183 data (TX ports). Wire one NMEA 0183 device per RX port to send data to a 4000/5000 series unit, wire up to three NMEA 0183 devices in parallel to each TX port to receive data from a 4000/5000 series unit.

Each RX and TX port has 2 wires, labeled A (+) and B (-) per the NMEA 0183 convention. Connect the corresponding A (+) and B (-) wires of each port to the A (+) and B (-) wires of your NMEA 0183-compliant device. Refer to the table and wiring diagrams when wiring the 4000/5000 unit to NMEA 0183 devices.

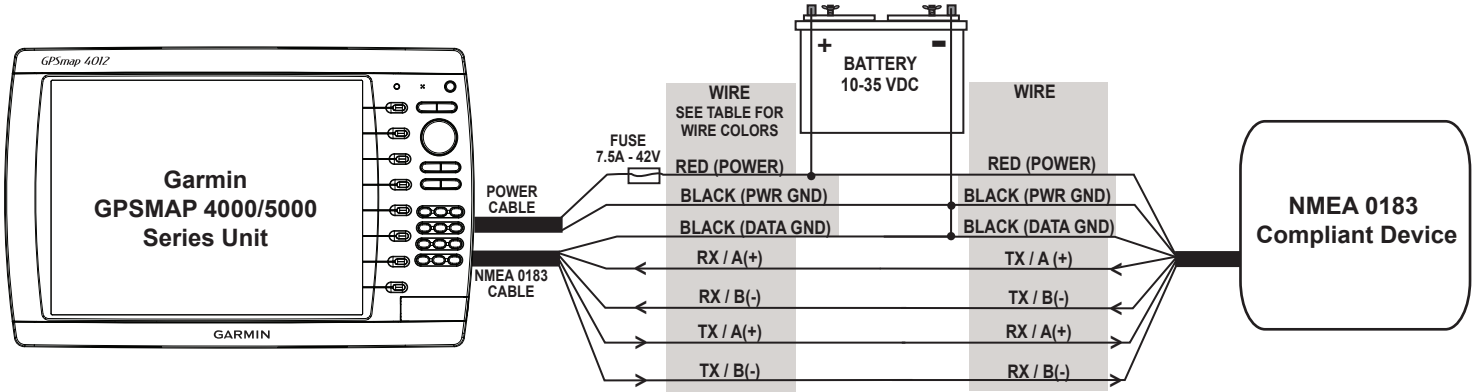
Consult the installation instructions of your NMEA 0183-compliant device to identify the Transfer (TX) A(+) and B(-) wires and Receiving (RX) A(+) and B(-) wires. Use 28 AWG, shielded, twisted pair wiring for extended runs of wire. Solder all connections and seal the connection with heat shrink tubing.

Notes:

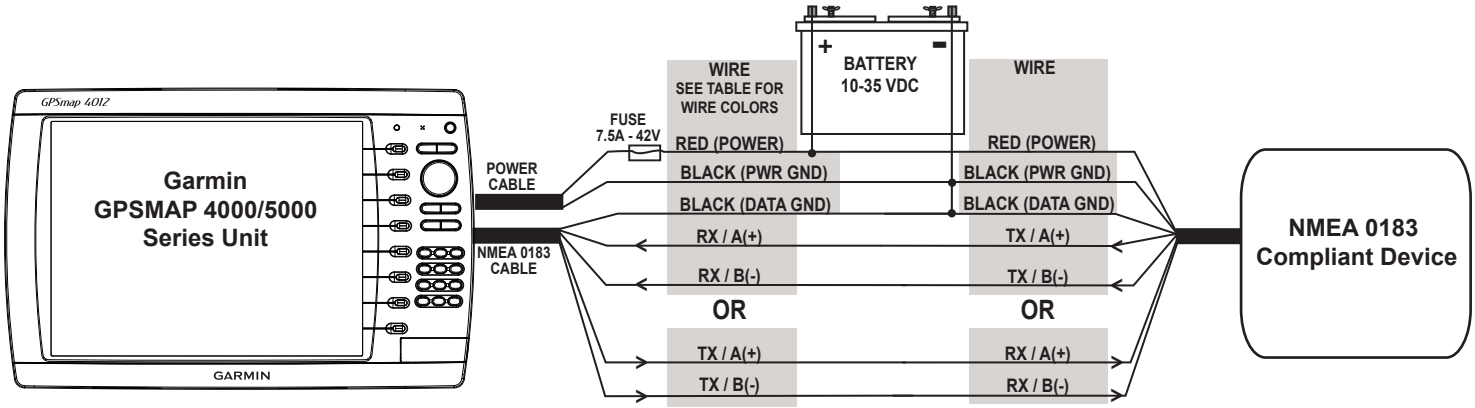
- For 2-way communication with a NMEA 0183 device, the ports on the GPSMAP 4000/5000 units are not linked. For example, if the RX port of the NMEA-compliant device is wired to TX port 1 on the GPSMAP 4000/5000, you can wire the TX port of your NMEA 0183-compliant device to RX port 1, port 2, port 3, or port 4 on the GPSMAP 4000/5000.
- The ground wires on the NMEA 0183 data cable from the GPSMAP 4000/5000 series unit and your NMEA 0183-compliant device must both be grounded.
- Approved NMEA 0183 sentences—GPBWC, GPRMC, GPGGA, GPGSA, GPGSV, GPGLL, GPBOD, GPRMB, GPRTE, GPVTG, GPWPL, GPXTE, and Garmin proprietary sentences—PGRME, PGRMM, and PGRMZ.
- This unit also includes support for the WPL sentence, DSC, and sonar NMEA 0183 input with support for the DPT (depth) or DBT, MTW (water temp), and VHW (water temp, speed, and heading) sentences.
- Use the Communications section of the Configure menu on the GPSMAP 4000/5000 series unit to set up NMEA 0183 communications. See the owner's manual for details.

Connector	Pin Number	Port Function	Wire Color
 NMEA 0183 Cable End View	1	RX PORT 1, A (+)	WHITE
	2	RX PORT 1, B (-)	ORANGE/WHITE
	5	RX PORT 2, A (+)	BROWN
	6	RX PORT 2, B (-)	BROWN/WHITE
	9	RX PORT 3, A (+)	VIOLET
	10	RX PORT 3, B (-)	VIOLET/WHITE
	11	RX PORT 4, A (+)	BLACK/WHITE
	12	RX PORT 4, B (-)	RED/WHITE
	3	TX PORT 1, A (+)	GRAY
	4	TX PORT 1, B (-)	PINK
	7	TX PORT 2, A (+)	BLUE
	8	TX PORT 2, B (-)	BLUE/WHITE
	13	GPS 17 IN	GREEN/WHITE
	14	GPS 17 OUT	GREEN
	15	SPARE	
	16	ALARM	YELLOW
	17	ACCESSORY ON	ORANGE
	18	GROUND	BLACK
	19	SPARE	

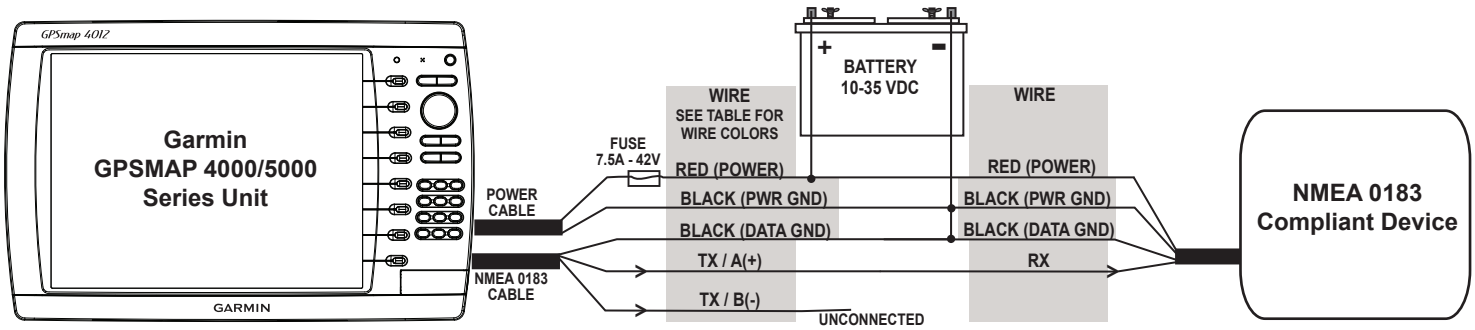
GPSMAP 4000/5000 Series NMEA 0183 Data Cable



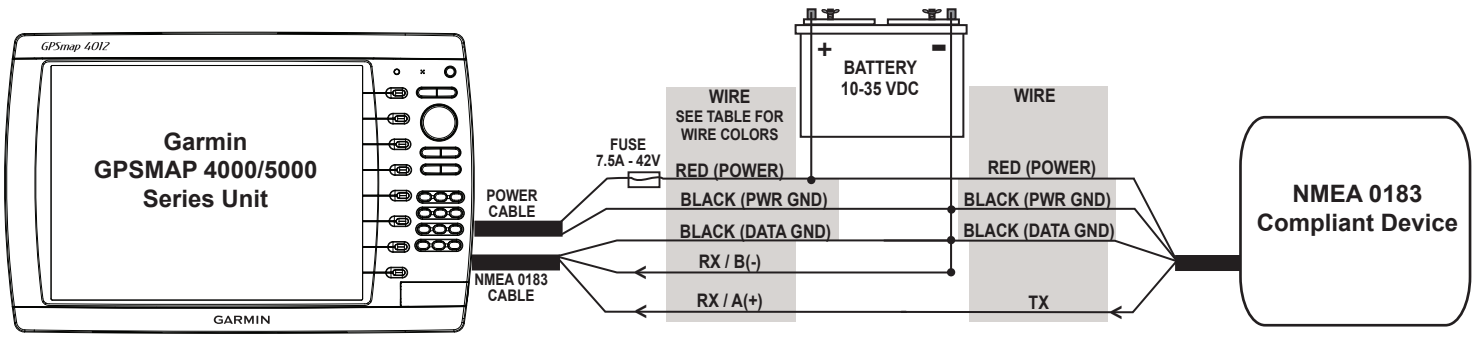
Wiring to a Standard NMEA 0183-compliant Device with 2-way Communication



Wiring to a Standard NMEA 0183-compliant Device for One-Way Communication



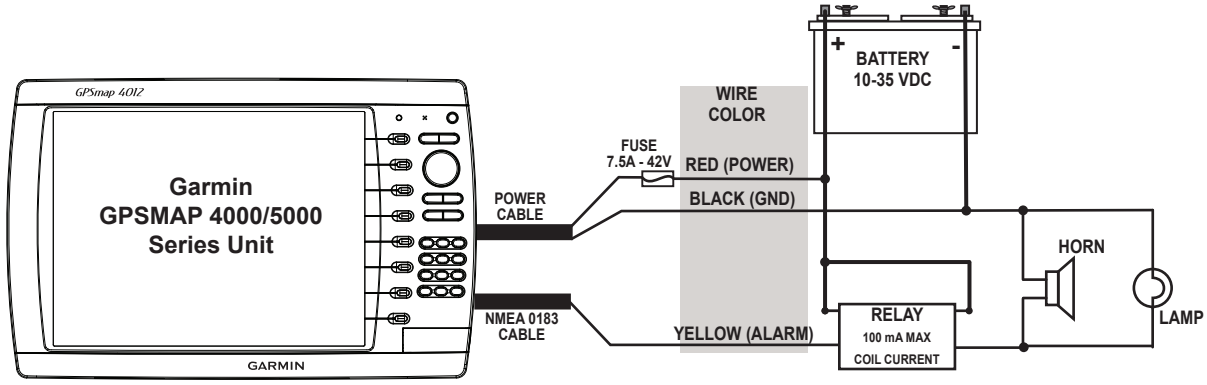
Wiring to Send Data to a NMEA 0183-compliant Device With a Single Wire TX Connection



Wiring to Receive Data from a NMEA 0183-compliant Device With a Single Wire RX Connection

Wiring to an Optional Alarm

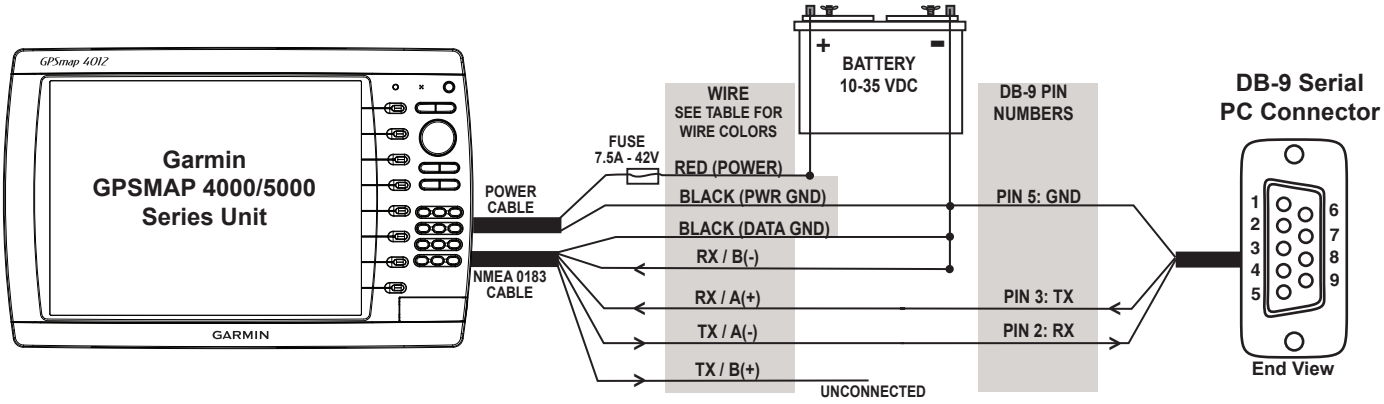
The GPSMAP 4000/5000 series unit can be used with a lamp, a horn, or both, to sound or flash an alert when the unit displays a message. The alarm does not need to be wired for the 4000/5000 unit to function. The alarm circuit pulls low when the alarm sounds. The maximum current is 100 mA, and a relay is needed to limit the current from the unit to 100 mA. A switch can be installed to select between visual and audible alerts.



Wiring to a lamp, a horn, or both.

Wiring to a DB-9 PC Serial Connector

The GPSMAP 4000/5000 series unit can be connected to a PC with a serial port by wiring the unit to a DB-9 serial connector.



Wiring to a DB-9 Serial PC Connector

Connecting to a NMEA 2000 Network

The GPSMAP 4000/5000 series unit is NMEA 2000 certified, and can receive data from a NMEA 2000 network installed on the boat to show engine specific information on the Gauges section of the Information screen. Also, the unit can receive heading data from a heading sensor connected to an installed NMEA 2000 network.

The 4000/5000 series unit features a male NMEA 2000 Micro-connector. Connect the unit to an installed NMEA 2000 network using a cable with a female NMEA 2000 Micro connector on one end and the appropriate connector for the installed NMEA 2000 network on the other end. NMEA 2000 cables are available from a local or online marine dealer.

NMEA 2000 Specifications:

Load Equivalency Number (LEN) = 2

Unit Draw = 75 mA max

NMEA 2000 PGN information

The GPSMAP 4000/5000 series unit accepts the following PGN information from a NMEA 2000 network:

059392 = ISO acknowledgement

059904 = ISO request

060928 = ISO address Claim

126996 = Product information

127250 = Vessel heading

127488 = Engine parameters, rapid update (up to four engines)

127489 = Engine parameters, dynamic (up to four engines)

127505 = Fluid level (0X00 fuel - does not support other fluid types)

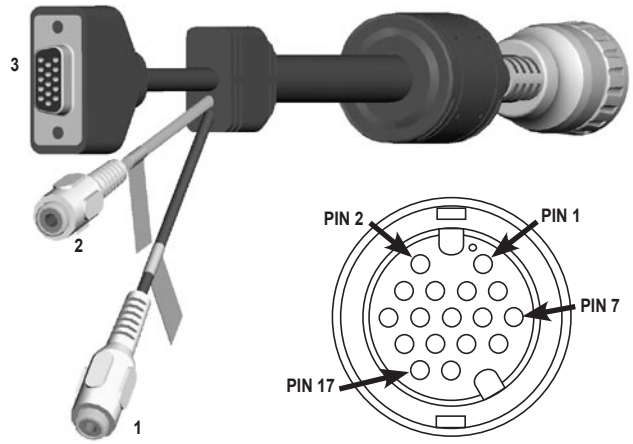
All GPSMAP 4000/5000 series units are NMEA 2000 certified.

Marine Video Cable

The included Marine Video 17-pin cable allows input of NTSC (National Television System Committee)/PAL (Phase Alternate Line) composite video sources, and PC monitor output (4008/4208/5008/5208 = VGA output, 4012/4212/5012/5212 = XGA output). Marine Video inputs are only available on the chartplotter to which they are attached and will not transmit over the Garmin Marine Network.

1 & 2. VIDEO 1 and VIDEO 2 Inputs (RCA connectors) allow input from two separate NTSC/PAL compatible video devices, such as VCR, DVD, TV, or a video camera. The chartplotter can display one video input at a time or alternate between the two. See the Owner's Manual for details. Sound from a video source must be attached to a separate stereo/audio system. The video output from video device attaches to the Video 1 (Black Cable) or Video 2 (Gray Cable) RCA connectors.

3. Use the PC monitor output (HD 15-pin) connector for remote viewing of the MFD display on a computer monitor. The remote monitor must be capable of at least VGA resolution and have multi-sync capability.



Marine Video Cable End View

Note	Connector	Pin	Function
1	RCA-1 CENTER	2	VIDEO 1 IN (BLACK JACKET)
	RCA-1 OUTER	6	VIDEO 1 IN, GND
2	RCA-2 CENTER	11	VIDEO 2 IN (GRAY JACKET)
	RCA-2 OUTER	15	VIDEO 2 IN, GND
3	HD-15 PIN 1	1	VGA, ANALOG-RED
	HD-15 PIN 2	4	VGA, ANALOG-GREEN
	HD-15 PIN 3	3	VGA, ANALOG-BLUE
	HD-15 PIN 5	13	VGA, ANALOG, GND
	HD-15 PIN 6	8	VGA, ANALOG-RED, GND
	HD-15 PIN 7	8	VGA, ANALOG-GREEN, GND
	HD-15 PIN 8	8	VGA, ANALOG-BLUE, GND
	HD-15 PIN 10	13	VGA, SYNC-GND
	HD-15 PIN 13	7	VGA, H-SYNC
	HD-15 PIN 14	12	VGA, V-SYNC
	HD-15 PIN SHELL	9	VGA, OVERALL SHIELD

Making the Final Connections to the GPSMAP 4000/5000 Unit

Once the power cable and the GPS 17 antenna (as well as any optional Garmin Marine Network devices, NMEA 0183 devices, NMEA 2000 connections, or video connections) have been wired to the boat, the cables must be connected to the GPSMAP 4000/5000 series unit.

There are seven connectors on the back of the unit, one for power, three for Garmin Marine Network devices, one for the NMEA 0183 cable, one for a NMEA 2000 cable, and one for the marine video cable.

To attach the power cable, the NMEA 0183 cable, and the marine video cable, carefully press the cable into the correct port on the back of the unit until it is firmly seated. **Do not force the cable, as this may damage the pins.** Once the cable is seated, turn the locking ring clockwise until it stops.

To attach a Garmin Marine Network cable or a NMEA 2000 Micro-connector cable, carefully press the cable into the correct port on the back of the unit until it is firmly seated. **Do not force the cable, as this may damage the pins**. Once the cable is seated, turn the locking ring clockwise until it is tight. Be careful not to overtighten.



GPSMAP 4000/5000 Series Connectors

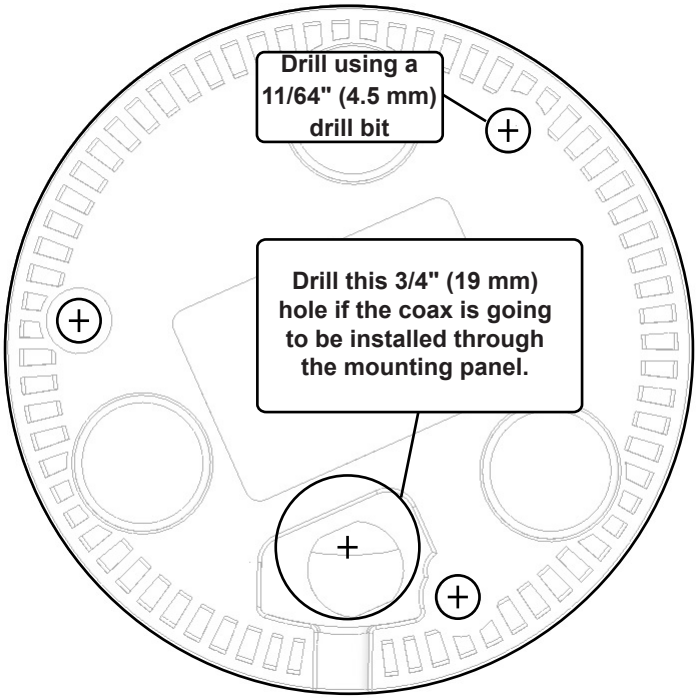


Updating the Unit Software

Your GPSMAP 4000/5000 series unit may contain a software update SD card. If so, follow the instructions provided with the card.

If a software update SD card is not included, visit www.garmin.com to make sure your chartplotter software is up-to-date. To determine the version of software on your unit, select or touch **Configure** > **System** > **System Information.**

GPS 17 Antenna Drilling Template



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